SBEE Cables (India) Limited # 29, J.C.W. Industrial Estate, 11 th KM. Kanakapura Road, Bangalore - 560 062 (INDIA)	TEST REPORT Type Test - As Per - IS 694: 2010	Doc. No. : F/FT/02 Rev No.. : 00 Page : 01 off 01
Customer : Kumar Electricals		**Date:- 18.05.2022**
PO. NO. KE:PO:017:2022-23 dtd. 16.05.2022		
Description: 1 Core X 4 Sq.mm ,Stranded (Circular) Class 2, Aluminium Conductor,PVC Type A FR Insulated Single Core Cable.		
Total Qty :- 100 mtrs X 30 Coils		

			No.of Sample	1	2	4
			Qty (Mtrs)	100	100	100
Sr.No.	**Description**	**Units**	**Specified Value**	**Observed Value**		
	Cable Type			AY		
	Size of Cable	Sq.mm		1 Core X 4 Sq.mm		
	Standard Applicable			IS 694 : 2010 , IS: 8130, IS: 5831		
	Voltage Rating	Volts		1100 Volts		
1	**Conductor (8130)**					
	a) No. of strands	Nos	7	7	7	7
	b) Type of Conductor			**Aluminium Conductor**		
	c) Strand Diameter (Before Stranding)	mm	0.85 ± 0.015	0.845 - 0.853	0.848 - 0.855	0.848 - 0.853
	d) Tensile Test (before stranding)	N/mm^2	100 (Min)	112	109	115
	e) Wrapping Test (before stranding)		Should not be break	Passed	Passed	Passed
	f) Conductor resistance at 20 oC	ohms/km	7.41 (Max)	6.95	6.98	6.94
2	**Test on PVC Insulation (IS- 5831)**					
	a) Type of Insulation		**Type A (FR) PVC**	**Type A (FR) PVC**		
	b) Colour of Insulation		**Black**	**Black**		
	c) Thickness of Insulation	mm	0.80 (Nom)	0.95	0.92	0.92
	d) Dia Over Insulation	mm	-	4.55	4.58	4.55
	e) Volume Resistivity at					
	27° deg C	Ohm-Cm	1×10^{13} (Min)	4.4×10^{13}	4.3×10^{13}	5.2×10^{13}
	70° deg C	Ohm-Cm	1×10^{10} (Min)	4.8×10^{10}	4.2×10^{10}	3.0×10^{10}
	f) Insulation Resistance test at					
	27° deg C	MΩ/km	36.7 (Min)	210	200	210
	70° deg C	MΩ/km	0.037 (Min)	0.215	0.205	0.215
	g) Water Immerssion test					
	AC Test (6 kv (rms) for 5 minutes)	rms	To Withstand	Withstood		
	DC test (1.2 kv DC test for 240 hrs)	rms	To Withstand	Withstood		
	h) Spark Test (In Process Test)	rms	6 kv AC	Withstood		
	a) Without ageing					
	i) Tensile Strength	N/mm2	12.5 (Min)	17	16.88	17.05
	ii) Elongation	%Ω	150 (Min)	262	272	266
	a) Without ageing					
	Tensile Strength	N/mm2	12.5 (Min)	14.39		
	Elongation	%Ω	150 (Min)	245		
	b) After ageing in Air Oven					
	Tensile Strength	N/mm2	12.5 (Min)	16.12		
	Variation	%	±20 (Max)	-12.02		
	Elongation	%	150 (Min)	215		
	Variation	%	±20 (Max)	12.24		
	c) Loss of Mass	mg/cm2	2.0 (Max)	0.6245		
	d) Hot deformation (Depth of indentation)	%	50 (Max)	15	14	12
	e) Heat shock test		No sign of cracks	No sign of cracks		
	f) Shrinkage Test	%	4.0 (Max)	1.4	1.3	1.2
	g) Thermal Stability	Minutes	80 (Min)	127	145	142
	h) Cold bend		No sign of cracks	No sign of cracks		
	FR Properties					
	Oxygen Index Test (ASTM D 2863)	%	29 (Min)	32.3		
	Temperature Index (ASTM D 2863)	°C	21 at temp of 250 °C (Min)	380		
	Flamability test					
	Length of unchared portion from bottom edge of the top clamp	mm	50 (Min)	430	440	410
	Period of burning after removal of flame	second	60 (Max)	5	6	4
4	Embossing/ Printing on Cable		Visual	SBEE Cables 4.0 Sq.mm 1100 Volts AY (FR) ISI ISI 694 : 2010 CM/L NO 6139768		
5	**High Voltage test at room temp.**	3kv (rms) for 5 minutes		Withstood		

Tested by

for SBEE CABLES (INDIA) LIMITED

Approved by

Quality Control Incharge

SBEE Cables (INDIA) Limited. Bangalore	QUALITY DEPARTMENT - FINAL TESTING SINGLE CORE TESTS - IS 694: 2010	DOC. NO : F/FT/05 REV .NO : 00 DATE : 01.01.2013 PAGE : 1 OF 1

TEST REPORT

Report No: MAY/2022/F323 — Date :-18.05.2022

Invoice No:

Customer : Kumar Electricals

PO. NO. KE:PO:017:2022-23 dtd. 16.05.2022

JOB. NO. : 53961

Material : 16.0 sq.mm . ABC Flexible FR-LSH Insulated Wire, Voltage Grade 1100 Volts

Specification As Per Generally - 694. IS 8130 , IS 5831 & As Per Customer Requirement

Quantity : 936 +602 mtrs (No . Of Sample - 1)

Colour : Red

Description	Units	Required	Measured Value
No .of. Samples			1
No .of. Strands	No	119	119
Strands Size	mm	0.41 (Max)	0.396-0.400
Dia Over Insulation	mm	8.10 (Max)	7.30
Insulation Thickness	mm	1.0 (Nom)	1.12
H.V.Test(Water Immersion) at Room Temperature	3 Kv (rms) for 5 mins	To Withstand	Withstood
Spark Test (In Process Test)	6 Kv	To Withstand	Withstood
Insulation Resistance at 27° C	MΩ/ Km	36.7 (min)	229
at 70° C	MΩ/ Km	0.037 (min)	0.277
Conductor Resistance	Ω/ Km	1.21 (Max)	1.13
Volume Resistivity at 27° C	Ω - Cm	$1x10^{13}$ (Min)	3.9×10^{13}
at 70° C	Ω - Cm	$1x10^{10}$ (Min)	3.8×10^{10}
Annealing Test	%	13.5 (Min)	24
Shrinkage	%	4.0 (Max)	1.5
Before Tensile Strength Insulation	N / mm²	12.5 (Min)	15.8
Before Elongation Insulation	%	150 (Min)	210
Hot Deformation Test(Depth of Indentetion)	%	50 (Max)	22
Heat Shock Test		No Sign of Cracks	No Sign of Cracks
Termal Stability Test	Minute	80(Min)	124
Printing Details		SBEE CABLES 1100V Y (FR-LSH) 16 SQ.MM ISI IS 694-2010 CM/L NO 6139768 2017	
Flame Retardant Test (Swedish Chemeny Test) Unaffected Portion From Top (SS 424 14 75 F3)	mm	300 (Min)	430
Result Based On Raw Material Lot Report			
Tensile Strength Insulation			
Before Thermal Ageing	N / mm²	12.5 (min)	14.60
After Thermal Ageing	N / mm²	12.5 (min)	15.98
Variation	%	± 20(max)	-9.45
Elongation Insulation			
Before Thermal Ageing	%	150 (min)	199
After Thermal Ageing	%	150 (min)	180
Variation	%	± 20 (Max)	9.55
Loss of Mass	mg / cm²	2 (Max)	0.8654
FR-LSH PROPERTIES			
Oxygen Index Test (ASTM D 2863)	%	29 (min)	32.90
Temperature Index (ASTM D 2863)	21 at temp Of 250° C		440
Smoke Density Test (ASTM D 2843)	%	60 (max)	46.86
Halogen Acid Generation Test (IEC - 60754-1)	%	20 (max)	17.15

Tested By

For SBEE CABLES (INDIA) LIMITED

Approved by

Quality Control Incharge

SBEE Cables (INDIA) Limited. Bangalore	QUALITY DEPARTMENT - FINAL TESTING SINGLE CORE TESTS - IS 694: 2010	DOC. NO : F/FT/05 REV .NO : 00 DATE : 01.01.2013 PAGE : 1 OF 1

TEST REPORT

Report No: MAY/2022/F324 — Date :-18.05.2022

Invoice No:

Customer : Kumar Electricals

PO. NO. KE:PO:017:2022-23 dtd. 16.05.2022

JOB. NO. : 53960

Material : 16.0 sq.mm . ABC Flexible FR-LSH Insulated Wire, Voltage Grade 1100 Volts

Specification As Per Generally - 694. IS 8130 , IS 5831 & As Per Customer Requirement

Quantity : 1039 + 499 mtrs (No . Of Sample - 1)

Colour : Black

Description	Units	Required	Measured Value
No .of. Samples			1
No .of. Strands	No	119	119
Strands Size	mm	0.41 (Max)	0.396-0.400
Dia Over Insulation	mm	8.10 (Max)	7.35
Insulation Thickness	mm	1.0 (Nom)	1.15
H.V.Test(Water Immersion) at Room Temperature	3 Kv (rms) for 5 mins	To Withstand	Withstood
Spark Test (In Process Test)	6 Kv	To Withstand	Withstood
Insulation Resistance at 27° C	MΩ/ Km	36.7 (min)	200
at 70° C	MΩ/ Km	0.037 (min)	0.212
Conductor Resistance	Ω/ Km	1.21 (Max)	1.15
Volume Resistivity at 27° C	Ω - Cm	$1x10^{13}$ (Min)	3.0×10^{13}
at 70° C	Ω - Cm	$1x10^{10}$ (Min)	2.2×10^{10}
Annealing Test	%	13.5 (Min)	25
Shrinkage	%	4.0 (Max)	1.3
Before Tensile Strength Insulation	N / mm^2	12.5 (Min)	16
Before Elongation Insulation	%	150 (Min)	218
Hot Deformation Test(Depth of Indentetion)	%	50 (Max)	20
Heat Shock Test		No Sign of Cracks	No Sign of Cracks
Termal Stability Test	Minute	80(Min)	124
Printing Details		SBEE CABLES 1100V Y (FR-LSH) 16 SQ.MM ISI	IS 694-2010 CM/L NO 6139768 2017
Flame Retardant Test (Swedish Chemeny Test) Unaffected Portion From Top (SS 424 14 75 F3)	mm	300 (Min)	430
Result Based On Raw Material Lot Report			
Tensile Strength Insulation			
Before Thermal Ageing	N / mm^2	12.5 (min)	14.60
After Thermal Ageing	N / mm^2	12.5 (min)	15.98
Variation	%	± 20(max)	-9.45
Elongation Insulation			
Before Thermal Ageing	%	150 (min)	199
After Thermal Ageing	%	150 (min)	180
Variation	%	± 20 (Max)	9.55
Loss of Mass	mg / cm^2	2 (Max)	0.8654
FR-LSH PROPERTIES			
Oxygen Index Test (ASTM D 2863)	%	29 (min)	32.90
Temperature Index (ASTM D 2863)	21 at temp Of 250° C		440
Smoke Density Test (ASTM D 2843)	%	60 (max)	46.86
Halogen Acid Generation Test (IEC - 60754-1)	%	20 (max)	17.15

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